

## **STRUCTURE 27**

This structure is a reinforced concrete, gated spillway, with discharge controlled by two stem operated, vertical lift gates. Operation of the gates is automatically controlled. The structure is located in the City of Miami near the mouth of Canal 7 about 700 feet from the shore of Biscayne Bay.

### **PURPOSE**

This structure maintains optimum water control stages upstream in Canal 7 (Little River Canal); it passes the design flood (75 percent of the Standard Project Flood) without exceeding upstream flood design stage, and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saline intrusion during periods of high flood tides.

### **OPERATION**

This structure is automatically operated between 1.0 to 1.9 to maintain as close as possible, the optimum headwater elevation of 1.5 feet. Gates will operate to maintain the optimum upstream water surface elevation as follows:

When the headwater elevation rises to 1.9 feet, the gates will open at six inches per minute;

When the headwater elevation rises or falls to 1.5 feet, the gates will become stationary;

When the headwater elevation falls to 1.0 feet, the gates will close at six inches per minute.

The gate closing level was lowered from 1.6 to 1.0 to protect manatees by reducing the gate moving activity.

In addition to maintaining optimum upstream fresh water control, as described above, the automatic controls on this structure have an overriding control which closes the gates, regardless of the upstream water level in the event of a high flood tide, whenever the differential between the head and the tail water pool elevations reaches 0.2 feet.

During the simultaneous occurrence of high tide and heavy rainfall in the low-lying urban areas draining into C-7, the structure control is placed on manual and the gates opened whenever the elevation of the headwater exceeds that of the tailwater. This action is necessary because of the very critical situation caused by the fact that a considerable urban area lies below or only slightly above the elevation of high tide.

A special timing device has been installed at this site to protect manatees, during automatic gate operation. This device causes alternate gate operation. During this operation, when the upstream float sensor indicates that the gate should open, one gate opens a minimum of 2.5 feet. If this opening results in a headwater stage below the gate close level, as it often does, this gate will close. Whenever the headwater stage again rises to the gate open level, the other gate will open in a similar manner.

#### **FLOOD DISCHARGE CHARACTERISTICS**

	Design	Standard Project Flood
Discharge Rate	<u>2800</u> cfs	<u>3070</u> cfs
	<u>75%</u> SPF	<u>100%</u> SPF
Headwater Elevation	<u>3.2</u> feet	<u>3.2</u> feet
Tailwater Elevation	<u>3.0</u> feet	<u>2.7</u> feet
Type Discharge	uncontrolled <u>submerged</u>	uncontrolled <u>submerged</u>

#### **DESCRIPTION OF STRUCTURE**

Type Fixed crest, reinforced concrete gated spillway

Weir Crest

Net Length 54.0 feet

Elevation -11.0 feet

Service Bridge Elevation 5.5 feet

Water level which will by-pass structure 4 feet

Gates

Number 2

Size 15.0 ft. high by 27.7 ft. wide

Type Vertical lift gates

Bottom elevation of gates, full open 4.5 feet

Top elevation of gates, full closed 4.0 feet

Control Automatic, on-site, upstream control with override  
differential control sensed by bubbler system and  
remote computer control.

Lifting mechanism

Normal power source commercial electricity

Emergency power source LP gas driven generator

Type hoist direct drive electric motor gear, connected to  
gear box and stems.

Date of Transfer: April 6, 1959 (beneficial occupancy); May 22, 1962

**ACCESS:** from the intersection of 4th Place and 83rd Street in the  
City of Miami

## **HYDRAULIC AND HYDROLOGIC MEASUREMENTS**

Water Level: Remote digital upstream and downstream recorders.

Gate Position Recorder: Remote digital recorder on both gates

Rain Gauge: Remote digital recorder

## **DEWATERING FACILITIES**

Storage needles at Miami Field Station, beams at West Palm Beach Field Station

Type needle beams and vertical aluminum needles

Size & number (per bay) \_\_\_\_\_

Upstream and Downstream

Number 1 beam; needles, 6 @ 4', 1 @ 3' wide

Size beam 24WF 160, length 28' -11  
needles 20' long